AMENDMENTS TO THE DRAWINGS

Applicant submits herewith a replacement drawing sheet for FIG. 8. No new matter has been added by way of this amendment.

Applicant's specification states "if the input voltage V_IN does not exceed the threshold voltage V_TH, power management module 38 enables the input transistor to transmit the input voltage V_IN to boost converter 56 (90)." However, the path going from block V_IN > V_TH? (86) to block ENABLE INPUT TRANSISTOR TO BOOST CONVERTER (90) illustrated by FIG. 8 was inadvertently improperly identified with "YES." The new version of FIG. 8 included in the attached sheets replaces the incorrect reference "YES" with the correct reference "NO" for the path between block 86 and 90.

REMARKS

This Amendment is responsive to the Office Action dated June 5, 2006. Claims 1-58 are pending.

Allowable Subject Matter

In the Office Action, the Examiner indicated that claims 5-9, 23-26, 29, 32, 34 and 39-42 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejection Under 35 U.S.C. § 112

The Examiner rejected claims 20, 27, 29, 32, 33 and 34 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner stated that claims 20, 27, 29, 32, 33 and 34 appear to be method claims but do not include method steps.

Applicant respectively traverses the rejection. Applicant submits that claims 20, 27, 29, 32, 33 and 34 further limit the method claims on which they depend, and are neither vague nor indefinite.

Claim 20, for example, specifies that the boost converter used in the method of claim 18 is a fixed-frequency switching mode boost converter. In this sense, claim 20 further limits the method of claim 18 to be applicable to a particular type of boost converter.

Similarly, claim 27 specifies that the programmer used in the method of claim 18 includes wireless telemetry circuitry with an antenna mounted internally within a housing associated with the programmer. Accordingly, claim 27 further defines the method of claim 18 in terms of the features of the programmer to which the method is applied.

As a further example, claim 29 specifies a threshold voltage used in inhibiting pulse skipping. Claim 29 very clearly defines the method in terms of a particular threshold voltage range.

Hence, as indicated by the above examples, the rejected claims appropriately provide further definition of the limitations set forth in the method claims from which they depend, and satisfy the requirements of section 112, second paragraph.

Claim Rejection Under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 1, 3, 4, 10, 11, 13-15 and 18 under 35 U.S.C. 102(e) as being anticipated by Carbunaru et al. (US 2004/0098068). Applicant respectfully traverses the rejection. Carbunaru fails to disclose all of the features of the claimed invention, as required by 35 U.S.C. 102(b), and provides no teaching that would have suggested the desirability of modification to include such features.

For example, Carbunaru fails to disclose or suggest a medical device programmer comprising a wireless telemetry circuit to communicate with the medical device, a boost converter to convert a battery voltage to an operating voltage for the programmer, and a control circuit to inhibit pulse skipping by the boost converter based on a level of the battery voltage, as recited by Applicant's claim 1.

Similarly, Carbunaru lacks any teaching that would have suggested a method for controlling a power supply in a programmer for a medical device, the method comprising applying a battery voltage to a boost converter to convert the battery voltage to an operating voltage for the programmer and inhibiting pulse skipping by the boost converter based on a level of the battery voltage, as recited in independent claim 18.

Carbunaru does even remotely suggest the requirements of Applicant's claims. Carbunaru fails to disclose not one, but several, features of Applicant's claims.

First, Applicant notes that the claimed invention relates to converting a battery voltage to an operating voltage. In contrast, the Carbunaru reference focuses on recharging a battery 16 in an implanted stimulator 10, and communicating with the implanted stimulator. Carbunaru makes no mention of a boost converter to convert a battery voltage to an operating voltage in a medical device programmer. Instead, Carbunaru is concerned with charging a battery. Carbunaru describes a base station 50 and a chair pad 32 with a coil 34 that inductively recharges battery 16 in stimulator 10 using power obtained from an AC power source adapter 52.

Carbunaru illustrates various voltage regulators, e.g., in FIG. 5, that convert a DC voltage obtained from AC power source 52 to different DC voltages. However, there is no battery voltage in the Carbunaru charging system 39. The battery 16 described by Carbunaru resides in the implanted stimulator 10, and is the recipient of charging current from charging system 39, rather than the source of an operating voltage. Hence, the claimed invention relates to

conversion of a battery voltage to produce an operating voltage, whereas Carbunaru is concerned with recharging a battery.

Second, according to the claimed invention, the battery voltage is converted to an operating voltage in a medical device programmer. The battery described by Carbunaru resides within implantable stimulator 10, not a medical device programmer. The Examiner characterized Carbunaru as disclosing the use of a programmer, but apparently overlooked the fact that Carbunaru provides no teaching concerning conversion of a battery voltage within that programmer. On the contrary, Carbunaru focuses on recharging a battery 16 within an implanted stimulator 10.

Neither clinician programmer 60 nor remote control 40 includes any battery having a battery voltage that is converted to an operating voltage. In addition to deriving operating power from an AC source rather than a battery voltage, the various voltage regulators described by Carbunaru do not even reside within a medical device programmer, but instead within a charging system 39.

Third, the claimed invention specifies that a battery voltage is converted by a pulse skipping boost converter. Carbunaru makes no mention of a boost converter, much less a pulse skipping boost converter. The Examiner stated that Carbunaru teaches an amplifier that acts "as a functional equivalent of" a boost converter. Applicant can find no support whatsoever for this statement.

Further, the concept of a "functional equivalent" has no basis in the law of anticipation under section 102. Rather, to anticipate a feature of the claimed invention, Carbunaru must exactly disclose that feature. Anything less than identity of such features must be addressed in the context of obviousness.

In any event, the amplifier in Carbunaru does not convert a battery voltage to an operating voltage for a medical device programmer. Notwithstanding this difference, none of the voltage regulators described by Carbunaru serves as a boost converter nor employs pulse skipping.

A boost converter converts one DC voltage level to another, higher voltage level. None of the voltage regulators described by Carbunaru converts the input voltage (24 VDC) to a higher voltage. Instead, with reference to FIG. of Carbunaru, the outputs of the voltage regulators are 6

VDC, 4.5 VDC, 12 VDC and 7 to 20 VDC. Applicant respectfully submits that the Examiner appears to have misinterpreted the meaning of a boost converter, which is well understood among those skilled in the art.

The Examiner confirmed that the description of a booster coil in Carbunaru pertains to the recharge of a battery. However, the booster coil in Carbunaru has nothing to do with DC-to-DC conversion. Rather, the booster coil is used to inductively charge battery 16 in stimulator 10. In particular, as described by Carbunaru, the booster coil is another charging coil used to recharge a battery that has been fully depleted to zero volts. In Carbunaru, booster coil amplifier circuitry receives DC voltage (7 to 20 VDC in FIG. 6) from a voltage regulator, but plays no role in DC-to-DC conversion.

Neither the voltage regulators nor the booster coil resemble a boost converter to convert a battery voltage to an operating voltage, as claimed. Carbunaru makes no mention of a pulse skipping boost converter. Even if the voltage regulators described by Carbunaru were relevant, none of them employs pulse skipping. Carbunaru does not even mention the concept of pulse skipping. Carbunaru describes a switching voltage regulator 603 in FIG. 5. However, there is no mention of pulse skipping in the regulator.

Of course, all of the differences described above only compound the glaring differences already noted above, i.e., that Carbunaru does not even contemplate conversion of a battery voltage to an operating voltage in a medical device programmer.

Fourth, inasmuch as it does not contemplate a pulse skipping boost converter, Carbunaru likewise fails to suggest inhibiting pulse skipping by such a boost converter, as required by the claims. In the absence of a pulse skipping boost converter, it is unclear how Carbunaru could have provided any teaching pertinent to inhibiting pulse skipping. The Examiner stated that Carbunaru describes a control circuit capable of inhibiting pulse skipping, but did not even identify any passage in Carbunaru that discloses a pulse skipping boost converter. In addition, as discussed below, the Examiner directly contradicted this statement in the remarks accompanying the rejection under section 103.

The Examiner pointed to paragraph [0015] and [0018]. In paragraph [0015], Carbunaru describes impedance matching between a booster coil and associated driver circuitry. In paragraph [0018], Carbunaru describes the use of a voltage of 3.3 VDC in most cases, such as

during charging, and the temporary use of 4.5 VDC during telemetry. Neither paragraph provides any teaching pertinent to inhibiting pulse skipping in a boost converter.

Fifth, Carbunaru clearly does not suggest inhibiting pulse skipping based on a level of a battery voltage that is converted to an operating voltage for a medical device programmer. Again, Carbunaru describes recharging a battery in an implanted stimulator. Carbunaru makes no mention of converting the battery voltage to an operating voltage for a medical device programmer, particularly via a pulse skipping boost converter. Consequently, any suggestion of inhibition of pulse skipping in a boost converter based on a battery voltage level is completely lacking from Carbunaru.

The Examiner asserted that Carbunaru describes turning an amplifier on and off using a transistor when the voltage of battery 16 exceeds a threshold voltage. However, the passages ([0084] and [0085]) identified by the Examiner appear to describe automatic tuning (impedance matching) based on whether or not the amplifier is turned on. Accordingly, the basis for the Examiner's assertion is unclear. Nevertheless, even if it were correct, the voltage level of the charged battery 16 in Carbunaru clearly does not qualify as the level of a battery voltage that is converted to an operating voltage using a boost converter in a medical device programmer, as claimed. Once again, Carbunaru fails to disclose or suggest a requirement of Applicant's claims.

In view of the several differences discussed above, it is clear that Carbunaru is virtually irrelevant to the limitations set forth in Applicant's claims. Carbunaru fails to disclose each and every limitation set forth in claims 1, 3, 4, 10, 11, 13-15 and 18. For at least these reasons, the Examiner has failed to establish a prima facie case for anticipation of Applicant's claims 1, 3, 4, 10, 11, 13-15 and 18 under 35 U.S.C. 102(b). Withdrawal of this rejection is requested.

Claim Rejection Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 1, 2, 11, 12, 16, 18, 20, 21, 22, 27, 28, 30, 31, 35-38 and 43-58 under 35 U.S.C. 103(a) as being unpatentable over Carbunaru in view of Hwang et al. (US 6,469,914). Applicant respectfully traverses the rejection. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed

invention. In particular, the Hwang et al. reference provides no teaching sufficient to overcome the basic deficiencies already discussed above with respect to Carbunaru.

For the shortcomings of Carbunaru relative to the claimed invention, including independent claims 1, 18, 35 and 51, and their respective dependent claims, Applicant generally refers to the discussion above with respect to the rejection under 102. However, Applicant is compelled to address some of the additional statements made by the Examiner.

For example, in support of the section 103 rejection, the Examiner again characterized the amplifier in Carbunaru as a "functional equivalent' of a "fixed-frequency switching-mode boost converter." Applicant again disputes the Examiner's assertion. A boost converter serves to convert one DC voltage to another, higher DC voltage, as is well understood among those skilled in the art. There is simply no concept of a boost converter in Carbunaru.

In addition, the Examiner asserted that any amplifying means would perform the same task as a boost converter "since no criticality was given to the use of a fixed-frequency switching-mode boost converter." The Examiner's assertion is incorrect. First, even if no criticality were discussed, a general "amplifying means" still would not function as a boost converter. Second, the Examiner's assertion that no criticality is discussed is incorrect. The invention focuses on boost converters and, particularly, inhibition of pulse skipping in such a boost converter. Accordingly, it is unclear how the Examiner could possibly conclude that a boost converter is not critical.

Third, even if criticality were lacking, it would not change the Examiner's burden in establishing a prima facie case of unpatentability. It is well established that the Examiner bears the burden of establishing a prima facie case of obviousness.[1] In doing so, the Examiner must determine whether the prior art provides a "teaching or suggestion to one of ordinary skill in the art to make the changes that would produce" the claimed invention.[2] A prima facie case of obviousness is established only when this burden is met.

Fourth, in the 103 rejection, the Examiner actually acknowledged that "the Carbunaru et al. patent does not teach the use of circuitry capable of inhibiting pulse skipping." This statement is absolutely correct, but directly contrary to the position taken by the Examiner in the rejection

[1] *In re Oetiker*, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).
[2] *In re Chu*, 36 USPQ2d 1089, 1094 (Fed. Cir. 1995).

under 102. This fundamental contradiction highlights the differences between the Carbunaru reference and the claimed invention.

Having acknowledged the lack of any circuitry to inhibit pulse skipping, the Examiner cited Hwang. The Examiner stated that Hwang teaches the use of circuitry to inhibit pulse skipping. Hwang describes a pulse width modulating (PWM) power converter and a pulse skipping circuit that disables switching based on comparison of the difference between an actual output voltage and a desired output voltage to a pulse skip reference voltage. In particular, when the difference is less than the pulse skip reference voltage, the pulse skipping circuit in Hwang is activated.

Hence, Hwang appears to describe activation of pulse skipping, rather than inhibition of pulse skipping. In addition, the pulse skip reference voltage is compared to a difference between an actual output voltage and a desired output voltage, rather than a level of a battery voltage that is being converted to an operating voltage. In fact, Hwang makes no mention of a battery at all. For at least the reasons stated previously in this Amendment, Carbunaru fails to disclose or suggest a control circuit to inhibit pulse skipping by a boost converter based on a level of a battery voltage. Hwang lacks any teaching sufficient to overcome the basic deficiencies described above with respect to Carbunaru. Withdrawal of this rejection is requested.

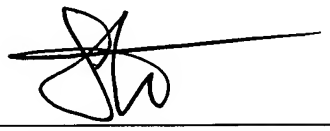
For at least these reasons, the applied references have failed to establish a prima facie case for non-patentability of Applicant's claims 1, 2, 11, 12, 16, 18, 20, 21, 22, 27, 28, 30, 31, 35-38 and 43-58 under 35 U.S.C. 103(a). Withdrawal of this rejection is requested.

In view of the fundamental differences identified above, with respect to both the rejections under sections 102 and 103, Applicant reserves comment concerning the additional features set forth in the dependent claims and the Examiner's characterization of such features or the prior art in relation to such features. However, Applicant neither admits nor acquiesces in the propriety of the Examiner's rejections with respect to such claims.

CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date: 9-5-06

By: 

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